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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/823,619

04/14/2004

Takashi Amano

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04/21/2006

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EXAMINER

STACE, BRENT S

ART UNIT

PAPER NUMBER

2161

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/823,619

Applicant(s)

AMANO ET AL.

Examiner

Brent S. Stace

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>4/14/04 and 8/4/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Remarks

1. Claims 1-23 have been examined. Claims 1-23 have been rejected. This document is the first Office action on the merits.

Information Disclosure Statement

2. The information disclosure statement is being considered by the examiner.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Drawings

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 109 of Fig. 1. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet

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should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. Since the lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors, Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the drawings. For example, the drawings should be carefully checked to ensure that all reference numerals are described in the specification, that no one reference numeral describes two separate drawing elements, or that the specification contains no reference to numerals not in the drawings.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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7. Claim 1, 6, 11, and 19 is rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,898,688 (Martin et al.).

Claim 1 can be mapped to Martin as follows: "A backup and recovery method [Martin, col. 5, lines 51-58 with Martin, col. 16, lines 55-64] for a storage system that avoids journal overflow comprising:

- producing at least a first snapshot of a data volume which is configured to receive data by way of write operations issued from a host device; [Martin, col. 6, lines 56-59 with Martin, col. 6, lines 20-29 with Martin, Fig. 1 and Fig. 2]
- producing a journal entry for each write operation issued from the host device; [Martin, col. 6, lines 20-29]
- storing each journal entry in a journal volume, thereby accumulating a list of journal entries; [Martin, col. 6, lines 20-29]
- monitoring an amount of free space on the journal volume; [Martin, col. 6, lines 30-39] and
- when the free space falls below a threshold value, taking a new snapshot of the data volume and deleting the oldest journal entry, thereby avoiding journal overflow" [Martin, col. 6, lines 30-39 with Martin, col. 6, lines 56-59 with Martin, col. 10, lines 15-19].

Claim 6 encompasses substantially the same scope of the invention as that of Claim 1, in addition to a method and some steps for performing the method steps of Claim 1. Therefore, Claim 6 is rejected for the same reasons as stated above with respect to Claim 1. Additionally, Claim 6 has the limitation of "logical snapshot" which can be

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mapped to Martin, col. 6, lines 30-39 with Martin, col. 6, lines 56-59 with Martin, col. 10, lines 15-19.

Claim 11 can be mapped to Martin as follows: "A backup and recovery method according to claim 6, wherein said logical snapshot includes changes to the data stored on the data volume as represented by a bitmap, [Martin, col. 7, lines 40-50 with Martin, cols. 9-10, lines 37-10 with Martin, col. 6, lines 55-60]

wherein each bit of the bitmap indicates whether a change has been made to a corresponding area of the data volume" [Martin, col. 7, lines 40-50].

Claim 19 encompasses substantially the same scope of the invention as that of Claim 1, in addition to a method and some steps for performing the method steps of Claim 1. Therefore, Claim 19 is rejected for the same reasons as stated above with respect to Claim 1. Additionally, Claim 19 has the limitation of "overwriting the oldest journal entry stored on the journal volume, thereby avoiding journal overflow" which can be mapped to Martin, col. 6, lines 30-39 with Martin, col. 6, lines 56-59 with Martin, col. 10, lines 15-19 "recycled."

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 2-5, 7-10, and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,898,688 (Martin et al.) in view of U.S. Patent Application Publication No. 2002/0133491 (Sim et al.).

For **Claim 2**, Martin teaches: "A backup and recovery method according to claim 1."

Martin discloses the above limitation but does not expressly teach: "wherein said threshold value is set in a management table which includes a plurality of entries each containing information of respective journal volumes."

With respect to Claim 2, an analogous art, Sim, teaches: "wherein said threshold value is set in a management table which includes a plurality of entries each containing information of respective journal volumes" [Sim, paragraphs [0339]-[0340]].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Sim with Martin because both inventions are directed towards utilizing disk space.

Sim's invention would have been expected to successfully work well with Martin's invention because both inventions use volumes (disks). Martin discloses a data management appliance comprising a backup and restore facility using journaling, however Martin does not expressly disclose that the threshold is specified in a management table having entries containing information of respective journal volumes. Sim discloses a method and system for managing distributed content and related metadata comprising a volume info table.

It would have been obvious to one of ordinary skill in the art at the time of invention to take the volume info table from Sim and install it into the invention of Martin, thereby offering the obvious advantage of using a volume info table to keep a close watch on the volumes so that management of the volumes is easier and/or faster. It is noted that the threshold of Martin is being used and that merely the storage of the threshold in a table of Sim is being used from Sim in this combination. This avoids the complimentary thresholds of Sim (which are the opposite thresholds of Martin). Martin's threshold is a threshold of free space, while Sim's threshold is a threshold of space utilized.

Claim 3 can be mapped to Martin (as modified by Sim) as follows: "A backup and recovery method according to claim 2, wherein one of said entries of said management table includes an indication of the size of a journal pool which includes said journal volume" [Sim, paragraphs [0339]-[0340]].

Claim 4 can be mapped to Martin (as modified by Sim) as follows: "A backup and recovery method according to claim 3, wherein said threshold value is an indication of

the lowest amount of free capacity of the journal pool the storage system is allowed to reach" [Martin, col. 6, lines 30-39].

Claim 5 can be mapped to Martin (as modified by Sim) as follows: "A backup and recovery method according to claim 3, wherein said threshold value is an indication of the lowest percentage measure of the amount of free capacity to the total amount of capacity of the journal pool the storage system is allowed to reach" [Sim, paragraphs [0339]-[0340]]. Here the percentage aspect of Sim's threshold is being combined with Martin's threshold.

Claims 7-10 encompass substantially the same scope of the invention as that of Claims 2-5, respectfully, in addition to a method and some steps for performing the method steps of Claims 2-5, respectfully. Therefore, Claims 7-10 are rejected for the same reasons as stated above with respect to Claims 2-5, respectfully.

Claims 20-23 encompass substantially the same scope of the invention as that of Claims 2-5, respectfully, in addition to a method and some steps for performing the method steps of Claims 2-5, respectfully. Therefore, Claims 20-23 are rejected for the same reasons as stated above with respect to Claims 2-5, respectfully.

11. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,898,688 (Martin et al.) in view of U.S. Patent No. 5,857,207 (Lo et al.).

For **Claim 12**, Martin teaches: ““A backup and recovery method [Martin, col. 5, lines 51-58 with Martin, col. 16, lines 55-64] for a storage system that avoids journal overflow comprising:

- producing at least a snapshot of a data volume which is configured to receive data by way of write operations issued from a host device; [Martin, col. 6, lines 56-59 with Martin, col. 6, lines 20-29 with Martin, Fig. 1 and Fig. 2]
- producing a journal entry for each write operation issued from the host device; [Martin, col. 6, lines 20-29]
- storing each journal entry in a journal volume, thereby accumulating a list of journal entries; [Martin, col. 6, lines 20-29]
- monitoring an amount of free space on the journal volume; [Martin, col. 6, lines 30-39] and
- when the free space falls below a threshold value, stopping the storing of journal entries, and taking a logical snapshot of the data volume, thereby avoiding journal overflow” [Martin, col. 6, lines 30-39 with Martin, col. 6, lines 56-59 with Martin, col. 10, lines 15-19 “relieved.” The stream of journal entries must stop in the situation where the journal space is exhausted and the journal entries are relieved (Martin, col. 10, lines 15-19 “to make room for new incoming journal transactions”). Also a snapshot is taken so the journal entries can be relieved as cited].

Martin discloses the above limitations but does not expressly teach: “switching to bitmap management.”

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With respect to Claim 12, an analogous art, Lo, teaches: "switching to bitmap management" [Lo, col. 44, lines 41-43 with Martin, col. 7, lines 40-50 with Martin, col. 13, lines 5-11].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Lo with Martin because both inventions are directed towards storing files.

Lo's invention would have been expected to successfully work well with Martin's invention because both inventions use a way to denote a range as being allocated or not. Martin discloses a data management appliance comprising a backup and restore facility using a virtual block map, however Martin does not expressly disclose his block map as being a bitmap depicted data structure. Lo discloses a storage manager for computer systems comprising a bitmap data structure.

It would have been obvious to one of ordinary skill in the art at the time of invention to take the bitmap data structure from Lo and install it into the virtual block map of Martin, thereby offering the obvious advantage of gaining a faster way of traversing the block map.

Claim 13 can be mapped to Martin (as modified by Lo) as follows: "A backup and recovery method according to claim 12, wherein when the storing of journal entries have been stopped and control is switched to bitmap management, said method further comprising:

- adding capacity to said journal volume" [Martin, col. 10, lines 15-19 "relieved"].

Claim 14 can be mapped to Martin (as modified by Lo) as follows: "A backup and recovery method according to claim 12, wherein said logical snapshot includes changes to the data stored on the data volume as represented by a bitmap, [Martin, col. 7, lines 40-50 with Martin, cols. 9-10, lines 37-10 with Martin, col. 6, lines 55-60]

- wherein each bit of the bitmap indicates whether a change has been made to a corresponding area of the data volume" [Martin, col. 7, lines 40-50].

12. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,898,688 (Martin et al.) in view of U.S. Patent No. 5,857,207 (Lo et al.), further in view of U.S. Patent Application Publication No. 2002/0133491 (Sim et al.).

For **Claim 15**, Martin (as modified by Lo) teaches: "A backup and recovery method according to claim 12."

Martin (as modified by Lo) discloses the above limitation but does not expressly teach: "wherein said threshold value is set in a management table which includes a plurality of entries each containing information of respective journal volumes."

With respect to Claim 15, an analogous art, Sim, teaches: "wherein said threshold value is set in a management table which includes a plurality of entries each containing information of respective journal volumes" [Sim, paragraphs [0339]-[0340]].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Sim with Martin because both inventions are directed towards utilizing disk space.

Sim's invention would have been expected to successfully work well with Martin's invention because both inventions use volumes (disks). Martin discloses a data management appliance comprising a backup and restore facility using journaling, however Martin does not expressly disclose that the threshold is specified in a management table having entries containing information of respective journal volumes. Sim discloses a method and system for managing distributed content and related metadata comprising a volume info table.

It would have been obvious to one of ordinary skill in the art at the time of invention to take the volume info table from Sim and install it into the invention of Martin, thereby offering the obvious advantage of using a volume info table to keep a close watch on the volumes so that management of the volumes is easier and/or faster. It is noted that the threshold of Martin is being used and that merely the storage of the threshold in a table of Sim is being used from Sim in this combination. This avoids the complimentary thresholds of Sim (which are the opposite thresholds of Martin). Martin's threshold is a threshold of free space, while Sim's threshold is a threshold of space utilized.

Claim 16 can be mapped to Martin (as modified by Lo and Sim) as follows: "A backup and recovery method according to claim 15, wherein one of said entries of said management table includes an indication of the size of a journal pool which includes said journal volume" [Sim, paragraphs [0339]-[0340]].

Claim 17 can be mapped to Martin (as modified by Lo and Sim) as follows: "A backup and recovery method according to claim 16, wherein said threshold value is an

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indication of the lowest amount of free capacity of the journal pool the storage system is allowed to reach" [Martin, col. 6, lines 30-39].

Claim 18 can be mapped to Martin (as modified by Lo and Sim) as follows: "A backup and recovery method according to claim 17, wherein said threshold value is an indication of the lowest percentage measure of the amount of free capacity to the total amount of capacity of the journal pool the storage system is allowed to reach" [Sim, paragraphs [0339]-[0340]]. Here the percentage aspect of Sim's threshold is being combined with Martin's threshold.

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Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Applicant is advised that, although not used in the rejections above, prior art cited on the PTO-892 form and not relied upon is considered materially relevant to the applicant's claimed invention and/or portions of the claimed invention.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brent S. Stace whose telephone number is 571-272-8372 and fax number is 571-273-8372. The examiner can normally be reached on M-F 9am-5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey A. Gaffin can be reached on 571-272-4146. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brent Stace


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